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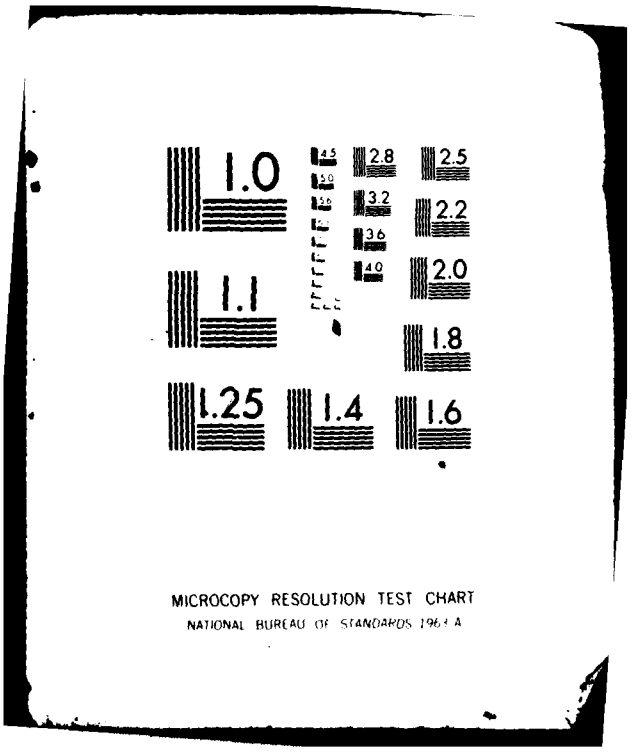
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December 1981

SOVIET POPULATION EVACUATION DECISIONS

SPC 759

FINAL REPORT

Contract AC10X707

PREPARED FOR

U.S. ARMS CONTROL AND DISARMAMENT AGENCY

PREPARED BY

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Results are presented of a brief study to identify the decisions that Soviet authorities would have to address if contemplating implementation of their civil defense evacuation programs under conditions of potential nuclear war. Decisions examined are those relating to timing and modality in the preparation for and execution of leadership/key worker dispersal, population evacuation, and industry relocation.

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CONTENTS

I. EXECUTIVE SUMMARY

A brief study was undertaken to identify the decisions Soviet authorities would have to make in implementing their civil defense evacuation programs under a variety of situations in which nuclear war is threatened. The Soviet civil defense program is examined in terms of three concepts: dispersal of key workers away from the cities to places from which they would commute to work; evacuation of non-essential persons to "safe" areas; and relocation of some industry to exurban areas.

It is concluded that the key evacuation decisions--whether to disperse essential workers, evacuate cities, and relocate industries--could be made during situations of tension, conventional war, or tactical nuclear war. During these times, the options open to the Soviets for offensive action, whether they be non-escalation, escalation, or a commitment to a preemptive strategic attack, will determine the nature and timing of civil defense preparations and actions.

The decisions discussed in the body of this report are primarily those relating to timing and modality. With respect to timing, issues are presented relating to when: to mobilize civil defense forces; to mobilize agriculture; to shift key industries; to shut down non-essential industries; to improve shelter readiness; and to return evacuees to the cities. The "how" and "whether" decisions relate to: allocating transport to civil defense; taking account of predictions of bad weather; running practice evacuations of the cities; and running all facets of the civil defense program at once or in parts.

This last question--whether to implement all of the civil defense program or only a part of it--is perhaps the most difficult and, therefore, the key issue that will confront Soviet decisionmakers. Soviet writings indicate that all parts of the program--dispersal, evacuation, and relocation--will be simultaneous. However, there are plausible situations in which the Soviets might be motivated to perform only dispersal, the least costly and most easily reversible step. In this connection, the issue of whether dispersal can be performed covertly is also discussed. But there are heavy penalties for miscalculation as well. For instance, if there is prompt U.S. retaliation to a Soviet nuclear strike, coupled with a failure to evacuate the cities in time, heavy Soviet casualties would result.

Finally, recommendations are given to possible future work, involving calculations of costs of various parts of the civil defense program as a function of time from initiation.

II. SOVIET POPULATION EVACUATION DECISIONS

A. PURPOSE

This work was undertaken in support of the civil defense research program of the Arms Control and Disarmament Agency (ACDA). Its purpose is to provide an assessment of the kinds of evacuation decisions that Soviet leaders would be required to make in the event of a nuclear conflict. Specifically, System Planning Corporation was asked to:

1. Define and formulate, in coordination with ACDA, a list of potential attack scenarios.

2. Formulate a list of evacuation decisions that could occur for each scenario, and discuss the issues and problems for each of them.

3. Where required and possible, perform quantitative analyses of such matters as additional blast casualties and evacuation costs.

B. SOURCES AND ASSUMPTIONS

The principal source of information on Soviet civil defense is an Interagency Intelligence Memorandum on this topic issued in 1977 and updated in 1981. The most exhaustive studies in the unclassified literature have been by Leon Gouré and T. K. Jones. Primary sources on the subject of evacuation have been Soviet writings and interviews with Soviet emigrés. Where judgments have differed among reports, those contained in the Interagency Intelligence Memorandum have been assumed to be authoritative. A list of principal sources is appended to this report.

There is general agreement on the key aspects of the Soviet civil defense program, in that:

- The Soviets have an extensive, nationwide civil defense program intended to:
  - -- protect the people--the leadership, essential workers, and the population,
  - -- protect the economy, and
  - -- provide for postattack recovery.
- Protection of the leadership, a portion of the essential work force, and a smaller fraction of the urban population will be afforded by blast shelters.
- Protection of the remaining essential workers as well as a large fraction of the urban population will be by evacuation from presumed nuclear target areas.

The movement of people away from hazardous areas is covered by three concepts--dispersal, evacuation, and relocation. Dispersal is defined as the organized removal and quartering of essential workers in the exurban zone. The dispersed workers would commute back to their jobs for their work shifts, and while on duty they would be able to use nearby blast shelters when necessary. Evacuation is the removal of non-essential persons to the exurban zone from zones of possible heavy destruction. Relocation involves the movement of equipment and personnel out of the urban areas and the setting up of plant operations in exurban areas. The distances key workers would be moved are 20 to 100 km from the cities involved. In many instances evacuees would be moved farther.

C. POTENTIAL ATTACK SCENARIOS AND THEIR IMPACT ON CIVIL DEFENSE PREPARATIONS

The most common Soviet scenario for general nuclear war starts with a period of international tension, followed by a NATO-initiated conventional war with the Warsaw Pact countries, which then goes badly for NATO forces; NATO escalates by initiating the use of theater nuclear weapons and the U.S.S.R. responds. The war then escalates to an intercontinental nuclear exchange in which the U.S. attempts to gain the initiative and the Soviet Union responds by attempting to preempt, or, if it fails, to launch from under attack. There are, however, many ways in which a war in Europe could initiate or escalate. There are other theaters in which U.S. and U.S.S.R. forces could become engaged. And, war between the U.S.S.R. and U.S. could arise directly rather than as escalation from a theater confrontation.

There is no time scale applied to the process by which the situation passes from peace to general nuclear war; presumably it can occur in the span of a few days or take many weeks. Soviet writings state that the order to evacuate cities would be given during the "special period"--a period of high tension and increased risk of war. However, the Soviets could defer activation of the civil defense machinery until after hostilities began. Although the Soviets have stated that they do not consider civil defense activities to be provocative, they know that measures such as evacuation would serve as indications to the West, and would have to plan their timing as part of their overall war planning.

Soviet writings also suggest that all civil defense preparations--dispersal, evacuation, and relocation--will occur simultaneously. But there are situations in which a sequential process might make more sense to them. For instance, if the Soviets had already committed themselves to launching an intercontinental nuclear strike, they might maximize surprise by making only those civil defense preparations that can be done covertly. Or, if the Soviets were undecided as to whether ongoing hostilities would lead to strategic nuclear war, they might decide to disperse essential workers while deferring decisions on the more costly steps of city evacuation and relocation of industry.

On the basis of the foregoing, it would appear that the key evacuation decisions--whether to disperse essential workers, evacuate cities, and relocate industries--could be made during situations of tension, conventional war, or

tactical nuclear war. In each of these three basic situations, the Soviets have a variety of options for offensive and defensive measures. The offensive action they decide on, whether non-escalation, escalation, or commitment to a preemptive strategic strike, will determine the nature and timing of the civil defense preparations and actions they take.

D. DISCUSSION OF EVACUATION DECISIONS

It does not suffice merely to discuss the conditions under which the Soviets might make the key evacuation decisions. Each of the key decisions requires for its effective implementation that a number of additional decisions be made. Suppose, for instance, that the Soviets have resolved to evacuate the cities; then questions arise as to which cities are to be evacuated, when and how to communicate orders to the populace, when to start the move, what resources of transport, food stocks, medical services, and engineering support should be allocated, and so forth. These questions may have all been resolved as part of Soviet advanced planning for implementation of their civil defense program; however, it is not clear from a perusal of the available literature what many of the answers are. There is, for example, virtually no discussion of such matters as the expected maximum duration of the "cities evacuated" situation and the criteria for deciding to return to the cities. Therefore, listed below are the key evacuation decisions and the secondary decisions that flow from them. For each such decision, the likely conditions under which they would be made are described and the issues confronting the decisionmakers are discussed.

Decision: Should there be practice evacuation of cities?

Although there have been civil defense exercises involving small-scale evacuations, there is no evidence that evacuation exercises involving the movement of people from large cities have been practiced. (There is also no counterpart in the U.S.S.R. of the "self-evacuation" that goes on in the U.S. and other Western countries when millions of people leave the cities on holiday weekends.) Clearly, the evacuation of a large city and the relocation of its inhabitants to areas about 200 km away is an enormously complicated operation, and valuable lessons would be learned from such an exercise. By the same token, its cost in terms of resources and lost production would also be very great. Evidently the Soviets have not considered the benefits to be commensurate with the cost, but this judgment might change in the future.

Repeated practice evacuation of cities in peacetime (together with exercises of offensive and other defensive forces) could be a way of preparing for a "bolt from the blue" strike at the West. The argument might be that if there were a history of such exercises, the Western countries might discount real preparations for a surpise strike as being another mass exercise. This tactic is not new--it was used by the Egyptians to lead to their successful Suez Canal crossing at the start of the Yom Kippur War with Israel.

Decision: When should civil defense forces be mobilized and deployed?

The first step in setting the civil defense process in motion is the mobilization of the civil defense forces. It is a decision that would have to take into account external factors, such as the anticipated reaction of the U.S.S.R.'s potential enemies. It would also be essential that the decision be coordinated with other strategic planning decisions, such as those relating to preparing to mobilize the armed forces. The decision to mobilize civil defense forces could be made in a period of crisis or any time after hostilities had started. It should be done at least three days before evacuation to ensure that dispersal and evacuation, if called for, go smoothly. Time must be allocated to prepare the evacuation assembly points. In addition, measures must be taken to ensure that the dispersal areas are equipped to receive the workers and their families. A paramount concern in this mobilization is the identification and coordination of available transportation.

A general mobilization of civil defense forces would probably involve upwards of 16 million people, although many of the participants would be perfunctory. Nevertheless, taking the step too early would involve some economic cost. More important, if too much time elapses between civil defense mobilization and evacuation, the effectiveness of the evacuation could be degraded. It seems logical that if time stretched on after civil defense mobilization with no action, the sense of urgency would fade, so that when evacuation was finally called for, both the civil defense forces and the populace would be less well prepared. If civil defense mobilization is too late, the chances of completing the evacuation before receiving nuclear strikes diminish.

It is also possible that civil defense mobilization could be part of a "saber rattling" posture on the part of the Soviets. In this case, it would be a part of a general mobilization of all defensive and offensive forces, and its timing would have nothing to do with the dispersal of key workers and the evacuation of cities.

Decision: When should leadership and important Party cadres be relocated?

The Soviet leadership and the Communist Party (CP) cadre are in a real sense the bulwark of the socialist system; thus, the timing of their relocation could pose a dilemma. Prudent planning would call for their early evacuation. However, too early an evacuation could cause undue concern at the lower echelons of authority and eventually in the populace at large regarding the severity of the crisis. Concern could turn to fear, then a breakdown in order. Clearly, the leadership and CP relocation is an important step that might have to be carried out in stages to minimize the possibility that such a breakdown might occur.

Decision: Should dispersal, evacuation, and relocation be simultaneous?

As stated earlier, Soviet doctrine suggests that dispersal, evacuation and relocation will take place simultaneously. But two situations in which the Soviets might favor a sequential process have already been mentioned:

- Uncertainty as to whether escalation to nuclear war will take place, resulting in the argument to perform only dispersal, the least costly and most easily reversible step.

- A commitment to preempt under conditions of maximum surprise to the West, resulting in an argument to take only the steps that can be done covertly--the dispersal of essential workers.

Arguments in favor of dispersal without evacuation and relocation might include:

- Disruption of the economy would be minimized.

- Burdens on the transport system would be greatly alleviated.

- The weight of any U.S. retaliatory attack would be greatly diminished by a successful Soviet preemptive strike.

Proponents of evacuation would probably argue that the risks were too great. (We do not have Soviet estimates of the increase in casualties resulting from not evacuating the population; however, authoritative Western sources have put this number as high as 100 million.) They would probably also point out that:

- Because of the sheer magnitude of the task, covert dispersal of half of the approximately 10 million key workers at any one time is perhaps unrealistic. And, since the use of broadcast media would be denied in a covert dispersal, great confusion could ensue.

- An overt dispersal of the key workers without measures taken to protect the rest of the populace would lead to general panic and noncompliance.

Decision: When should key industry be shifted to wartime production?

The shift to wartime production is closely keyed to the decision to mobilize the key worker force. Before the decision is made, however, supply lines must be organized and raw materials identified and stockpiled. Time must also be allocated to industries that are to shift their product lines. It goes without saying that there is an economic price to pay to convert these industries, and premature conversion of industries would result in lost production as well.

Decision: When and how should nonessential industry be shut down?

Shutting down nonessential industry involves a number of complex issues. This decision and how it is handled affects the economy, the population, and crisis management. A key point is whether this will be carried out in stages or rapidly, once the decision is made. Problems that must be considered include:

- Certain industries require time-consuming shut-down procedures, such as steelworks; otherwise irreparable damage might result.
- The decision to shut down must be tied to an impending decision to evacuate; otherwise panic might ensue.
- If the shutdown is in stages, must the evacuation also be in stages?
- A rapid shutdown of industry might be considered to be an indicator of an impending strike by the U.S.S.R.'s enemies. However, if the shutdown is delayed until full-scale evacuation, expedient hardening of industry would probably not be carried out. Post-attack recovery could suffer.

Decision: When should agriculture be mobilized?

Once evacuation appears likely, agriculture must be mobilized. Certain measures must be taken to prepare for the arrival of the evacuees, such as protecting livestock and food stuffs, readying essential services, and preparing expedient shelters. Existing structures would have to be modified to enhance fallout protection. One further consideration is that the actual mobilization of agriculture could be delayed somewhat by harvesting or planting factors. This, in turn, would affect evacuation or the rate of evacuation.

Decision: How will transportation needs for dispersal and evacuation be satisfied?

The Soviet Union is a country with a transportation system that is inferior by Western standards. Most rail lines are single track. Roads are poor--only one-third of them being hard surfaced. There are 20 people for every motor vehicle (compared to 1.4 people per motor vehicle in the U.S.). In a crisis the mobilization of ground forces and their movement to border areas would require substantial allocations of rail and other transport, and would probably receive top priority. It is in this context that one must examine the problems that would face civil defense authorities. It is likely the civil defense forces would be given transport sufficient for dispersal of key workers, but whether enough vehicles would be available for evacuation is much less certain. The civil defense authorities would probably have to commandeer private vehicles, use intra-urban and inter-urban bus and rail lines to the extent possible, and carry people in open trucks and other vehicles not designed for that purpose. They will have to cope with masses of people at the

evacuation points awaiting transport, breakdowns in transport vehicles, and the spectre of serious delays in the evacuation process.

Decision: Should dispersal and evacuation plans be altered to account for predictions of bad weather?

Much of the inhabited areas in the Soviet Union are subject to harsh winters, with average daily temperatures below freezing for five months or more. Yet, the efficacy of dispersal, evacuation, and relocation programs is likely to be very sensitive to the occurrence of poor weather. In such conditions, the key worker travel times and material deliveries could be stretched out. Of more concern, weather could seriously delay or even prevent the completion of certain evacuation procedures such as a walkout. Civil defense authorities, facing predictions of poor weather, might argue for a postponement of planned dispersal and evacuation. But it is more likely that overall war planning by the leadership will dictate the civil defense activities.

Decision: When should shelter state or readiness be improved (e.g., food, medical supplies)? How much should be provided to evacuees?

The decisions to disperse and to evacuate require an earlier decision to provide for the needs of the workers and families by improving the state of shelters. Stocks of food, bedding, clothing, and medical supplies must be provided to the shelters if the key worker system is to be successful. Evacuees, on the other hand, can be directed to bring a certain amount of their own supplies. The amount of reserves in the shelters are finite, however. The timing of the decision to disperse or evacuate must consider and weigh the possible duration of the stay and the consequence of an early emergence from the shelter.

Decision: Should evacuation be in stages--or at one time?

An evacuation in stages would, in general, be less disruptive to the economy and to the transportation network. For example, areas near probable targets or in the city core could be the first to evacuate. The evacuation would then proceed in stages outward from these areas. At any time able-bodied citizens could be encouraged to "walk out," circumstances permitting. But, this approach does have the drawback that it would prolong the time to evacuate and therefore lengthen the time in which the populace is at risk.

A decision to evacuate at one time places great burdens on the transportation network. It will have to respond first to the military, then to the key worker system, and finally to the demands of evacuation. How effectively these three competing demands can be coordinated is uncertain. In addition, since evacuation requires that people move large distances from the risk areas (>200 km), it would be difficult to turn evacuation vehicles around rapidly since they could be tied up for 12 to 18 hours at a time. Thus, in a real

sense the "combined" effort program (i.e., a walkout) mentioned by General Altunin, the Commander of Soviet Civil Defense Forces, may be an important means of alleviating the burden on transportation in a mass evacuation, provided that the weather permitted it, and provided also that masses of people on foot on roads did not severely limit the capacity of the roads to handle vehicular traffic.

In the figure below, taken from A Study of Candidate U.S. Civil Defense Programs, the percentage of risk population evacuated is shown as a function of time. Presumably, the general relationship would hold for a Soviet evacuation situation as well. If so, it suggests that about 50 percent of the risk area population might be evacuated within one day from the start of the movement of people. To these times there might well be added a "start-up" time of perhaps 4 hours or longer to allow for unanticipated implementation problems.

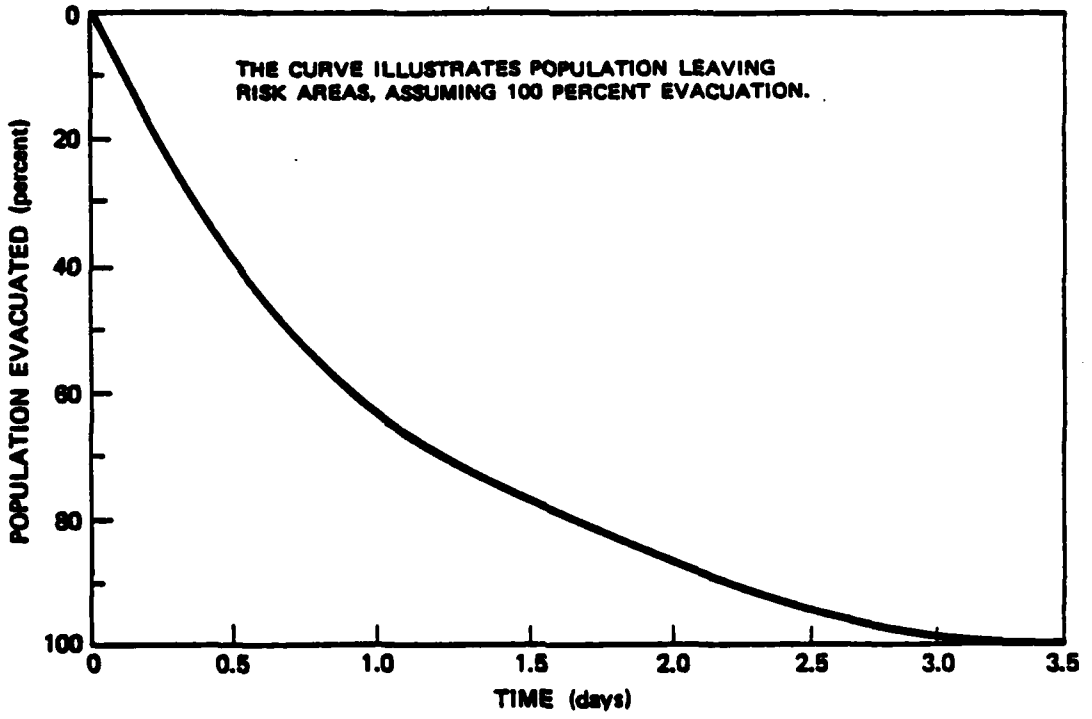

FIGURE.
ESTIMATED PERCENT OF RISK POPULATION EVACUATED VERSUS TIME

Decision: When should evacuees be returned to the cities?

Soviet doctrine does not prescribe a general fixed duration for the evacuation phase. Radiation levels from fallout would be expected to drop to a tolerable level within a week from the time of the initial strike, and if this were the only criterion, the evacuation phase might be relatively short. The Soviets would have to decide whether to anticipate follow-on strikes and to judge the likely frequency and severity. If the nuclear war became protracted, the Soviets would have to balance the costs to their war effort of keeping the cities evacuated against the prospects of casualties to those people who had returned to cities that might still be attacked.

Return of evacuees might also be delayed because of the need to restore transportation facilities to use and to make habitable again those areas that had sustained damage. Premature return of evacuees to damaged areas might impede the recovery effort. The Soviets might also consider a partial return of able-bodied persons to provide manpower for restoration work.

III. RECOMMENDATIONS

It was not possible, within the time available for this work, to perform extensive quantitative analyses on evacuation costs and blast casualties. Yet estimates of such matters could provide better insights on the Soviet civil defense program. The probable resolution of some of the problems and issues ascribed to Soviet decisionmakers might be clarified. Specifically, the following types of research might be fruitful:

- Estimate the cost in resources and lost production of evacuation of the cities, in terms of initial and continuing costs.
- Construct charts showing key phases in the evacuation process plotted against minimum and average times and showing the numbers of people in transit (and therefore at risk) as a function of minimum and average times. Calculate probable ranges of casualties from nuclear attack as a function of time into the evacuation process.
- Estimate the costs in resources and lost production of dispersal of key workers.
- Estimate the costs in resources and lost production of a program to relocate industries.

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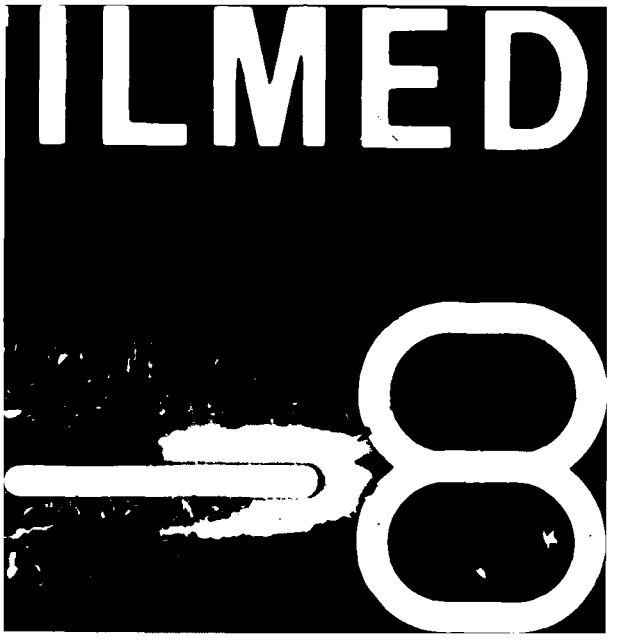
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